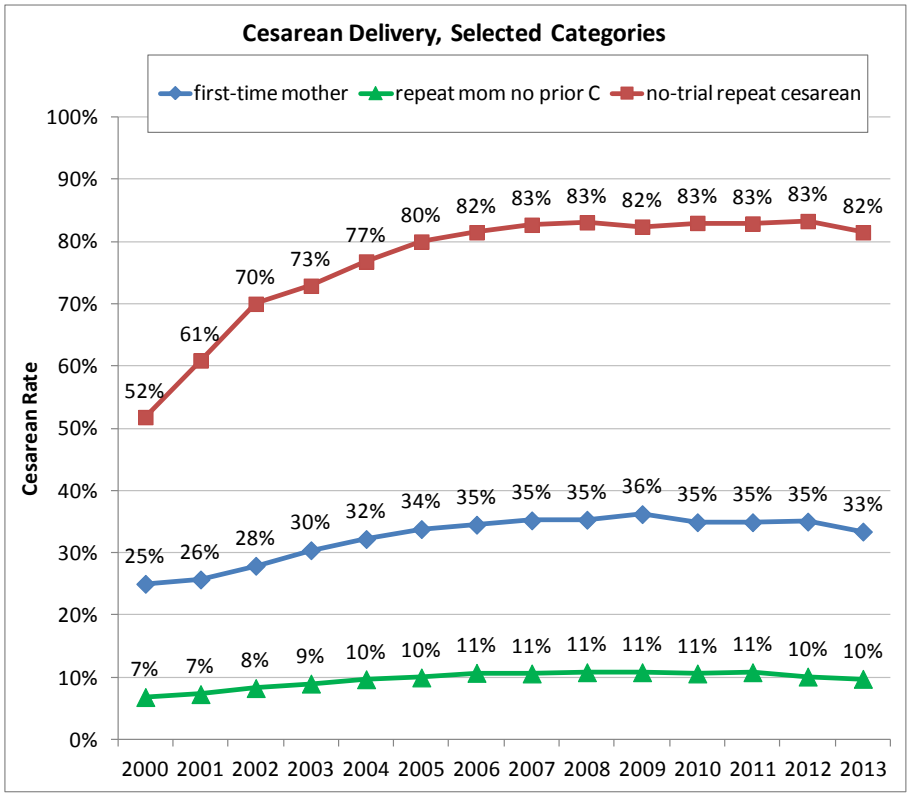
Maternal & Child Health Epidemiology

CESAREAN DELIVERY: COMPARING NEW JERSEY HOSPITALS, 2013

Synopsis for graphical data updates.

The Maternal and Child Health Epidemiology Program within the Department of Health and Senior Services systematically monitors cesarean delivery and associated perinatal health issues. (http://nj.gov/health/fhs/professional/safequality.shtml) Hospital-specific data on cesarean delivery are now publicly available. Comparisons between hospitals can be useful both for assessing clinical practice and for informing individual choices.

Cesarean delivery experienced a decade-long surge in New Jersey (see graph); the elective and non-elective use of this surgical procedure has been controversial for much longer. In this regard, New Jersey has been at the front of a wave sweeping the whole country. The national cesarean delivery rate had increased from 21% in 1996 to 32% in 2008. States neighboring New Jersey also have higher-than-average rates.



New Jersey's recent trends appear to be strongly influenced by hospital and clinician practice. Cesareans increased most among women who: had mild complications with previously low risk of cesarean delivery; had a cesarean for an earlier child; or whose labor was induced artificially. The majority of cesareans in each category might be considered discretionary and avoidable.

APPROACH

To make valid comparisons between hospitals, statistical measures should emphasize clinical comparability, predictive validity and reliability. Because each hospital has a different mix of patients, a simple percentage of all cesareans divided by all births does not meet these criteria. We therefore use a more refined approach.

***The most common obstetric categories*.** We refer to singleton pregnancies delivering after 37 weeks of pregnancy (term) with the baby's head down (vertex) as *TSV*, *low-risk* or *standard presentations*. In 2013, and consistent previous years, they accounted for 86% of births and 76% of cesareans. We divide them into three groups:

- *first-time moms* (also known as *Nullip* or NTSV)
- *repeat moms with no previous cesareans*
- *repeat cesareans and vaginal birth after previous cesarean* (*VBAC*)

Average rates of cesarean delivery are very different in these groups— 33%, 10% and 90%, respectively.

Some medical conditions clearly indicate a necessary cesarean. The following conditions can be diagnosed objectively *prior to labor*: severe uterine bleeding, uterine tissue anomaly, severe hypertension, preeclampsia, eclampsia, fetal growth restriction (measured after the fact by birthweight less than 10th percentile for gestational age), excessive fetal growth (birthweight greater than 90th percentile for gestational age). Cesarean delivery is standard practice in such cases to protect the health of mother and baby. In keeping with standards endorsed by The Joint Commission, the National Quality Forum and other healthcare quality organizations, we exclude all such cases from statistics here.

Cesarean with and without trial of labor are different. In every obstetric category listed above, cesareans without labor have increased much faster than cesareans after a trial of labor. The two represent entirely different decision processes with different indications and benefits. Safety issues for mother and baby are also somewhat different. It is therefore important to monitor these two variations separately.

Hospital performance in context. Comparing cesarean rates within specific clinical categories is important in considering the choices and risks relevant to an individual mother.

Even within these categories, outcomes in individual hospitals vary substantially. For example, in 2013:

History	***Range of Hospital Cesarean Rates (from 10th to 90th percentile)***	
	Without trial of labor	***After trial of labor***
First live birth	4-16%	17-29%
All prior deliveries vaginal	2-8%	2-6%
Any prior cesarean delivery	69-96%	0-53%

DESCRIPTION OF MEASURES

Exhibit 1 presents the calculations in the accompanying graphs.

In previous years, our analysis of variations in hospital cesarean outcomes included less common obstetric categories, such as multiple gestations. Beginning in 2010, we have chosen sharper focus over comprehensiveness. Since 2007 we have constructed a *risk-adjusted* index for each hospital that allowed overall comparisons in spite of patient mix; that index is tabulated in Exhibit 2. Other data items reported in 2007 and 2009 are still available by request.

Note: hospitals in each graph are sorted by the overall risk-adjusted cesarean index, from lowest to highest. Index is the weighted average of cesarean rates in the three major obstetric categories (first-time mom, repeat mom without cesarean, repeat cesarean) using the statewide distribution of births in these three categories from 2013.

Exhibit 1.

Table 1: Cesarean Deliveries to First-time Mothers.		
Selection: no previous live birth; singleton, 37+ weeks gestation, head-down position; indicator negative for uterine bleeding, chronic hypertension, preeclampsia, eclampsia; birthweight at least 10th percentile for gestational age, and at most 90th percentile for gestational age		
measure	*numerator*	*denominator*
Cesarean, no labor	Cesarean indicator=yes and trial of labor=no	All live births in selection
Cesarean, after labor	Cesarean indicator=yes and trial of labor=yes	All live births in selection
Table 2: Cesarean Deliveries to Repeat Mothers.		
Selection: 1+ previous live birth; singleton, 37+ weeks gestation, head-down position; no prior cesareanindicator negative for uterine bleeding, chronic hypertension, preeclampsia, eclampsia; birthweight at least 10th percentile for gestational age, and at most 90th percentile for gestational age		
measure	*numerator*	*denominator*
Cesarean, no labor	Cesarean indicator=yes and trial of labor=no	All live births in selection
Cesarean, after labor	Cesarean indicator=yes and trial of labor=yes	All live births in selection
Table 3: Labor Induction and Cesarean Delivery.		
Selection: no previous cesarean; singleton, 37+ weeks gestation, head-down position; indicator negative for uterine bleeding, chronic hypertension, preeclampsia, eclampsia; birthweight at least 10th percentile for gestational age, and at most 90th percentile for gestational age		
measure	*numerator*	*denominator*
Cesarean, first-time mom	Cesarean indicator=yes and induction of labor=yes	No previous live births and induction of labor=yes
Cesarean, repeat mom	Cesarean indicator=yes and induction of labor=yes	1+ previous live births and induction of labor=yes
Table 4: Repeat Cesarean Delivery and VBAC.		
Selection: previous live birth by cesarean; singleton, 37+ weeks gestation, head-down position; indicator negative for uterine bleeding, chronic hypertension, preeclampsia, eclampsia; birthweight at least 10th percentile for gestational age, and at most 90th percentile for gestational age		
measure	*numerator*	*denominator*
Repeat Cesarean, no labor	Cesarean indicator=yes and trial of labor=no	All live births in selection
Repeat Cesarean, after labor	Cesarean indicator=yes and trial of labor=yes	Trial of labor=yes and 39+ weeks gestation. Minimum 10 trials to report

Exhibit 2. Risk-adjusted Cesarean Delivery Index for 2013

North Jersey		
Univeristy of Medicine & Dentistry of New Jersey - University Hospital	956	0.254
Palisades Medical Center - New York Presbyterian Heathcare System	1,064	0.28
Englewood Hospital and Medical Center	1,403	0.285
The Mountainside Hospital	950	0.3
Clara Maass Medical Center	1,113	0.332
The Valley Hospital	2,172	0.332
Holy Name University Medical Center	1,045	0.335
Newark Beth Israel Medical Center	2,001	0.344
Hoboken University Medical Center	887	0.349
Pascack Valley Hospital	49	0.35
Saint Barnabas Medical Center	3,826	0.352
Christ Hospital	655	0.374
St. Joseph's Regional Medical Center	2,307	0.383
Hackensack University Medical Center	4,205	0.39
Liberty HealthCare System, Inc. - Jersey City Medical Center	1,203	0.42
Liberty HealthCare System, Inc. - Meadowlands Hospital Medical Center	526	0.426
St. Mary's Hospital Passaic	620	0.479
Northwest& Central Jersey		
Capital Health Medical Center - Mercer (Hopewell)	1,664	0.285
Hunterdon Medical Center	648	0.29
Morristown Memorial Hospital	2,940	0.301
University Medical Center at Princeton	1,414	0.301
Raritan Bay Medical Center	870	0.306
Trinitas Hospital	1,626	0.308
Chilton Memorial Hospital	649	0.313
Saint Peter's University Hospital	3,703	0.313
Overlook Hospital	1,830	0.316
Robert Wood Johnson University Hospital	1,408	0.317
RWJ University Hospital at Hamilton	751	0.318
Somerset Medical Center	555	0.318
Hackettstown Community Hospital	326	0.34
Saint Clare's Hospital/Denville	841	0.342
Capital Health Regional Medical Center - Helene Fuld	144	0.344
Newton Memorial Hospital	353	0.344
JFK Medical Center	1,741	0.377

South Jersey		
Monmouth Medical Center	3,444	0.191
The Cooper Health System	1,243	0.25
Kimball Medical Center	707	0.264
Our Lady of Lourdes Medical Center	642	0.274
Kennedy University Hospital- Washington Township	617	0.284
South Jersey - Elmer	265	0.301
Meridian Health - Jersey Shore	1,308	0.306
Virtua West Jersey Hospital - Voorhees	4,023	0.311
Cape Regional Medical Center	337	0.319
Meridian Health - Ocean Medical Center	670	0.325
South Jersey Regional Medical Center-Vineland	1,307	0.33
Underwood Memorial Hospital	588	0.332
Virtua Memorial Hospital of Burlington County	1,663	0.344
AtlantiCare Regional Medical Center-Mainland Division	1,635	0.352
Meridian Health - Riverview Medical Center	990	0.352
The Memorial Hospital of Salem County, Inc.	145	0.356
CentraState Healthcare System	965	0.361
Community Medical Center	1,038	0.363
Shore Memorial Hospital	706	0.37
Meridian Health - Southern Ocean Medical Center	274	0.387

Source: Provisional 2013 Electronic Birth Certificate File compiled by MCH Epidemiology Program.
"Births" includes TSV nullip, multip and repeat/VBAC categories.